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ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXX. NOVEMBER, 1919. NO. 9.

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A few Observations on the Tendency of Insects to Collect on Ridges and Mountain Snowfields.

By EDWIN C. VAN DYKE, Berkeley, California.

The article on the insect life of high altitudes,* recently contributed to this journal by Dr. L. O. Howard, has tempted me to add a few more notes on the same subject from my own field experiences.

While collecting in the high Cascades and Sierra Nevadas, I have found at times, particularly during the early summer when insect life was most abundant, that my most profitable work could be done above the normal line of vegetation. On the snow fields insects were to be found either running over those portions adjacent to the bare rocks and ground or more or less widely scattered over the face of the ice at higher levels. On the bare peaks and rocky ridges other insects were also to be found.

*"A Note on Insects Found on Snow at High Elevations," by L. O. Howard, Entom. News, Vol. xxix, No. 10 (Dec., 1918), p. 375.

On our higher mountains as well as in the far north the summer advances rapidly and insect life as a consequence appears with a rush. Insects will always be found following close upon the retreating snow. On the moist earth, just below the lower margins of the rapidly melting snow fields, numerous predaceous Coleoptera, such as the smaller Carabidae and Staphilinidae as well as small Diptera, can be found. These insects and numerous spiders become very active during the warmer parts of the day and their peregrinations are often extended during this time over the adjacent snowfields and sometimes for considerable distances. One summer I found certain species of *Platynus* and *Bembidium* so numerous along the lower margins of the snow on Mt. Lyell that I was kept busy for quite a time gathering them in. This same tendency of the smaller Coleoptera to run out over the snowfields was also noted later when on Mt. Rainier and on the mountains of the Aleutian Islands.

On the snowfields at higher levels, chiefly those on favorable exposures, other insects were to be noted. These were of miscellaneous types, such as are normally to be found flying about the trees and over the grassy slopes of the mountains at lower altitudes, and were no doubt carried upwards by the gradually rising currents of air. Becoming tired or somewhat chilled as they were wafted over the icy slopes, they were impelled to settle, when they soon became benumbed and ultimately frozen. On the west slopes of Mt. Rainier during the middle of July, 1905, I often amused myself by traveling over the lower snowfields looking for the unlucky derelicts. The insects which I found were of all orders, Hymenoptera, Diptera, Lepidoptera, Hemiptera and Coleoptera. Of the Hymenoptera I remember particularly the Ichneumonidae and Formicidae, particularly the large wood ants of the genus *Camponotus*. Of the Hemiptera I secured several Cicadidae, many Pentatomidae and Coreidae and noted remains of numerous Miridae, which last, because of their frail nature, had so rapidly disintegrated that they were not worth picking up. Of the Coleoptera there were many Cerambycidae, both day

and night-flying species, a few Buprestidae, numerous Chrysomelidae, Byrrhidae, Coccinellidae and Scarabaeidae, and some Elateridae, Rhynchophora and other miscellaneous groups. Some of the specimens were merely benumbed, others quite dead, while still others were badly disintegrated. The more recent arrivals were on the surface of the snow, but those which had been trapped earlier were sometimes several inches below the surface, at the bottom of small shafts, where the heat of their bodies, or the greater amount of heat attracted by their darker coloring, had caused them to be deposited by the more rapid melting of the snow in their immediate neighborhood. On the snowfields in the Sierras the same thing has been observed. In fact, so general is this condition during the early summer months that it is wise for collectors planning work in the high mountains to make arrangements to take advantage of this. One's eyes should always be protected by smoked glasses and the face blackened as the glare of the snow on bright days is very intense. The insects are very conspicuous against the white background, so are easily seen and besides contain many prizes. One may also often have the good fortune to appear upon the scene soon after a mountain storm, when the booty will sometimes be very great. These high winds sometimes lift up hosts of many of the more powerful flying insects and leave them chilled and stranded on the icy slopes of the higher mountains. The alpine butterfly, *Oeneis ivallda* Mead, has several times been found so distributed on the high mountains of the southern Sierras.

About the bare peaks and ridges insects are also quite evident. Here, however, they are alive and active. Certain kinds even seem to have a particular liking for such localities, as for instance among the Diptera, the Bombylidae, Syrphidae and Tachinidae. Among the butterflies several species have also been noted which seem to take delight in seeking the highest points of the ridges. *Papilio zolicaon* Boisd. is one of these, and the alpine species of *Pieris* also favor such places. The peaks are also favorite congregating regions for vast quantities of Coccinellidae, especially *Hippodamia 5-signata*

Kirby, though a few *Cocinella monticola* Muls. are often associated with them, and multitudes of the winged ants of the genus *Camponotus*. The lady beetles and the ants finally perish in such places and through the succeeding years often form considerable accumulations in the crevices of the rocks. This was noted on the summits of the Tatoosh Range in the Cascades, also on Mt. Tallac and other peaks of the Sierras. Though this tendency of the Coccinellidae to collect on the exposed peaks is injurious to their race and might be classed as a pathological condition, the beetles do have a normal congregating instinct which, when directed to more favorable localities, as in sheltered valleys and lower ranges, is a benefit. This normal habit of congregating for purposes of hibernating is however not peculiar to the lady beetles. Among the Coleoptera it is almost equally common among certain Chrysomelidae and Rhynchophora and is to be found also among the Hemiptera. In fact, the custom of certain species of Coccinellidae, Chrysomelidae and Rhynchophora to seek the uplands and tops of the lower ridges of certain parts of California as winter approaches has been so well known to certain entomologists that they purposely do much of their winter collecting in such places. In the clefts of the rocks along the crest of the San Bruno hills, which form the southern boundary of San Francisco County, we have often found during the winter months fair assemblages of such beetles as *Hippodamia convergens* Guer., *Disonycha maritima* Mann. and *Cassida nigripes* Oliv., and at the bases of the rocks *Notiophilus semiopacus* Esch. and *Amara aurata* Dej. Several of these are only to be found at other times of the year as isolated specimens and never on the ridges. On Mt. Tamalpais, just across the Golden Gate from San Francisco, winter colonies of *Phagiodera prasinella* Lec. and *Sitones sordidus* Lec. can always be found and I have noted various small colonies of similar beetles on the Berkeley hills as well as on the hills near Los Angeles. The list of species which congregate in various places for purposes of hibernation or aestivation is really quite extensive.

A New Geometrid from Arizona (Lepid.).

By Wm. Barnes, M.D. & A. W. Lindsey, Ph.D., Decatur, Illinois.

In the "Novitates Zoologicae" XXV, p. 376, under his new genus *Anurapteryx*, Sir George F. Hampson mentions an undescribed species of which Dr. McDunnough has informed him. The species is represented in the Barnes collection by two females, from which we have drawn up the following description.

Anurapteryx crenulata sp. nov.

Vestiture of head and thorax luteous with the scales dark gray near the tips. Front paler. Antennae brown with luteous scales above, powdered with gray scales and obscurely annulate toward base. Abdomen luteous, powdered with gray. Under surface similar.

Primaries above pinkish luteous with a broad transverse median band heavily powdered with dark gray scales, widest from cubitus to costa, constricted behind cubitus, and widened again just before inner margin. Outer margin of band scalloped, inner very indefinite. Basal area paler, powdered with gray. Median band followed by a narrow band of the ground color, which is the most conspicuous feature of the wing. This band shades into fuscous toward the s. t. line. There is a subterminal series of slightly paler lunules, outwardly edged with dark gray. Terminal area and fringes concolorous with lunules, cut by ground color at veins. Veins alternately marked with dark gray and pinkish luteous. Entire wing with obscure, slender, powdery, transverse lines, outwardly scalloped, which may be so indistinct as to give it a strigate appearance. Under surface with the outer margin of the median band distinctly marked; basal half grayish. Subterminal dark shade visible, terminal area pale, sharply separated from dark shade on the crenulate s. t. line.

Secondaries: Basal half powdered with gray, this area terminating in an irregular dark line which is lost toward the costa. Beyond this the wing is similar to the primaries, but a little more pinkish and more evenly powdered. Under surface with dark line reproduced. Terminal half of wing powdered with gray except near dark line. Veins as above. Entire wing a little more pinkish than the primaries.

The crenulate lines of the paratype are less definite than those of the type, giving the specimen a regularly strigate appearance, and there are a few other minor differences in the markings. The species differs from *beckeri* Druce (Biol.

Cent. Am., Lep. Het. Pl. 98, fig. 1) in the conspicuous transverse band of the primaries, equally pale throughout its length, and the absence of the yellow shade of the secondaries.

Type 1 ♀, Paradise, Arizona, July. *Paratype* 1 ♀, Palmerlee, Arizona. Both in coll. Barnes, Decatur, Ill.

Hampson includes *Anurapteryx* in the family Sematuridae. According to Forbes it falls in the sub-family Coronidiinae of the Geometridae, (See Jn. N. Y. Ent. Soc., XXV, 47, 52, 1917). No representatives of either have previously been recorded from this country.

We take this opportunity to call attention also to a specimen of *Zunacetha annulata* Guér. taken at San Benito, Texas, and now in the Barnes collection. The species has not previously been recorded north of Vera Cruz, Mexico.

Notes on two Miridae, Camptobrochis and Paracalocoris (Heteroptera).

By W. L. McAtee, Washington, D. C.

Camptobrochis poecilus Reuter ms.

Specimens of *Camptobrochis* have been distributed under this name by the late Otto Heidemann and, using his application of the name, by the writer. Having collected numerous specimens both on the food plant and in hibernation, I became interested in finding out the true name of the bug. It soon became apparent that *Camptobrochis validus* Reuter was rather a lost species and that the *C. poecilus* ms. seemed to fit the description of *validus* very well. At this stage of the study I was assisted very much by the kind loan by Mr. E. P. Van Duzee of a specimen of *C. validus* determined by Reuter. To make a long story short, it appears that *Camptobrochis poecilus* Reuter ms. is the same as *Camptobrochis validus* var. *cunealis* Reuter,* originally described in part from District of Columbia material.

The distinguishing character of the variety is the chiefly

* Bemerkungen uber Nearktische Capsiden, etc. Acta. Soc. Sci. Fennicae, 36, No. 2, 1909, p. 59.

red cuneus. From simply having the cuneus red, the form varies in rubescence, until in extreme cases the legs chiefly and the venter entirely are involved.

The variety hibernates in the adult stage and has been found under bark of birch, sycamore and maple. The food plant, or at least a food plant, is alder (*Alnus rugosa*), from which at Great Falls, Virginia, nymphs were collected August 21. Associated with this *Camptobrochis* were *C. nebulosus* and species of *Lygus*.

Paracalocoris acceptus McAtee var. **marmoratus** n. var.

Poecilocapsus marmoratus Uhler ms.

Color markings usually more extensive, and deeper than in the typical variety,* brownish black. Antennae darker, especially the third and fourth joints; second with a distinct pale annulus just basad of middle, two complete dark vittae along upper part of side of thorax, and a much interrupted vitta on lower pleurae. Two short fuscous vittae on disc of scutellum.

Type, a female from San Jose del Cabo, Lower California, Type No. 22,592 U. S. National Museum. Four paratypes also from Lower California (U. S. N. M.)

While on the subject of *Paracalocoris* it is worth noting that *P. limbus* (loc. cit., p. 380), described from an elevation of more than 2000 feet near Clayton, Georgia, appears to be a mountain form, as it has subsequently been received from Southern Pines, North Carolina, and from Mt. Tom, Massachusetts.

An Interesting Gynandromorphic Butterfly (Lepid.; Rhop.).

Master George F. Pettinos, of Merion, Pennsylvania, has recently captured a gynandromorphic specimen of *Papilio turnus*. The left hand side of the specimen has the wings normal male, and the right side of the specimen has the wings normal male, and the right side is black female. Mr. W. H. Edwards in his *Butterflies of North America*, Vol. 2, figures a specimen in which the left wings are black female and the right wings are yellow female. This is the first specimen I have seen in which the two sides represent the male and female.—HENRY SKINNER.

**Paracalocoris acceptus*. McAtee, W. L., Key to the Nearctic species of *Paracalocoris*. Ann. Ent. Soc. Am., Vol. 9, No. 4, Dec., 1916, p. 389 [Organ Mts., N. Mex.].

Two New Asyndetus with a Table of the North American Species (Dolichopodidae, Diptera).

By M. C. Van Duzee, Buffalo, New York.

Table of Males.

1 All tibiae partly or wholly yellow.....2
Hind tibiae black 5
2 Fore tarsi modified; hind tibiae blackened at base.....3
Fore tarsi normal; hind tibiae blackened at tip.....4
3 First joint of fore tarsi incrassated.....*ammophilus* Loew
Second joint of fore tarsi with a clavate, haltere-like, yellow appendage .....*appendiculatus* Loew
4 Front and face very wide and covered with silvery pollen; palpi black .....*latus* V. D.
Ground color of the front and face showing through the white pollen; palpi rather large, white.....*caudatus* V. D.
5 All tibiae black or brown.....6
Fore tibiae yellowish, sometimes the middle ones also.....9
6 Third antennal joint large, about twice as long as wide.....7
Third antennal joint rather small, but little longer than wide...8
7 Second antennal joint extending over the upper edge of third joint to near its middle .....*occidentalis* sp. nov.
Second antennal joint not extending beyond the base of third joint .....*nigripes* V. D.
8 Mesonotum with a brownish-dusted vitta, between two bluish gray ones .....*fratellus* Ald.
Mesonotum not vittate .....*interruptus* Loew
9 Third antennal joint somewhat quadrilateral in outline.....10
Third antennal joint not at all quadrilateral in outline, but with a point or rounded at tip 12
10 Fore tibiae with only short hairs; third antennal joint but little longer than wide .....*cornutus* V. D.
Fore tibiae with long bristle-like hairs on the whole upper surface; third antennal joint twice as long as wide; second joint extending to the middle of the third above, at which point the third is attached 11
11 Second antennal joint ending in a rounded tip near the middle of third joint, which is nearly straight above....*syntormoides* Wh.
Second antennal joint ending in a sharp point at tip; upper edge of third joint concave .....*harbeckii* V. D.
12 Third antennal joint rounded at tip; second joint reaching the middle of the third above.....*longipalpis* sp. nov.
Third antennal joint rounded below, pointed at tip.....13

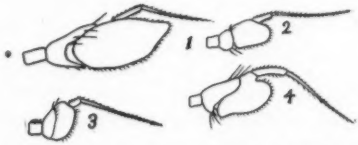
13 Third antennal joint notched where the arista is inserted; fore tibiae with a row of rather long slender bristles above, *johnsoni* V. D.

Third antennal joint not notched on upper edge where the arista is inserted; fore tibiae with a row of small hair-like bristles above or nearly bare ..... *texanus* V. D.

Asyndetus occidentalis sp. nov.

♂. Length 2.5-3 mm. Face moderately wide, a little longer than wide, with thin white pollen, the ground color showing through. Front a little wider than the face, shining green; palpi and proboscis black. Antennae black (Fig. 1), not large, second joint extending narrowly to near the center of the upper edge of third joint, at which point the third joint is attached. Lateral and inferior orbital cilia white, a few of the upper cilia black.

Thorax and pleurae shining green with more or less blue reflections, in the holotype the thorax is mostly blue. Abdomen green with black incisures and coppery reflections; hypopygium small with small bristles.



Antennae of *Asyndetus*.—Fig. 1, *A. occidentalis* male; fig. 2, *A. occidentalis* female; fig. 3, *A. nigripes* female; fig. 4, *A. longipalpis* male.

Coxae and femora metallic green; tibiae and tarsi black; fore femora with a row of black bristles below, which are not as long as the width of the femora, outer side with rather long hairs; fore tibiae with a row of hair-like bristles above. Calypters and halteres whitish, the former with white cilia.

Wings grayish; last section of fourth vein bent near its apical third but not interrupted, beyond this bend the vein is very thin, not much more than a fold in the wing; cross-vein far before the tip of the first vein.

♀. Agrees with the male, except that the fore tibiae have three small bristles and a row of short hairs above. The antennae are also smaller than those of the male.

Described from two males and twelve females taken at Los Banos, California, May 22, 1918, by E. P. Van Duzee.

Type in the collection of the California Academy of Sciences.

The male differs from that of *A. nigripes* in the formation of the antennae and the last portion of the fourth vein is more slender. The female differs in the form of the antennae. Fig. 3 is the antenna of the female of *nigripes*, while Fig. 2 represents that of the female of *occidentalis*.

Asyndetus longipalpis sp. nov.

♂. Length 3.7 mm. Face wide with silvery white pollen; front blue-green, the white pollen of the face extends onto the lower half of the front. Antennae black (Fig. 4), third joint broadly rounded at tip, attached to the second at a point near the middle of its upper edge; palpi nearly as long as the antennae, narrow, black, fringed with black hairs; upper orbital cilia black, lower whitish, becoming longer below.

Thorax shining green with bronze reflections and with grayish pollen along the front, which forms quite distinct vittae. Scutellum and second abdominal segment with strong blue reflections. Abdomen green with quite abundant white pollen; base of segments three to five blackish, the border of this black color and the base of the second segment coppery. Hypopygium small, in the type with one large bristle (probably there were more but they have been broken off).

Coxae and femora black with slight green reflections; fore femora with a row of bristles below; middle femora with long hairs below. Fore and middle tibiae yellow; hind tibiae blackish; middle and hind tibiae each with about four bristles above, those of the middle pair the longest. All tarsi blackish. Calypters and halteres whitish, the former with white cilia.

Wings tinged with brown, especially in front; last section of fourth vein broken near its second third, its last portion being entirely separated from the first; cross-vein nearly opposite the tip of the first vein.

♀. Face a little wider; palpi of the usual form, black; thorax with three narrow coppery vittae on the dorsum; wings less tinged with brown.

Described from one pair taken at Puerto Barrios, Guatemala, in March. *Type* in the author's collection.

Chalcid Travels Through Blackbird (Hym.).

At the meeting of the Entomological Society of London, held Dec. 4, 1918, the President, Dr. C. T. Gahan, exhibited a Chalcid, *Torymus elegans* Borkh., which had emerged from a rosaceous seed which had passed through the alimentary canal of a blackbird, together with the seed from which it had appeared. (Ent. Mo. Mag., London, February, 1919.)

Tinea cloacella Haworth bred from Fungi (Lepid.).

By Harry B. Weiss, New Brunswick, New Jersey.

In Dyar's List of North American Lepidoptera (Bull. 52, U. S. N. M.), the distribution of *Tinea cloacella* is given as follows:—"Europe, U. S.?" Dietz in his revision of the *Tineinae* (Tr. Am. Ent. Soc. vol. XXXI, No. 1, 1905, p. 67) writes as follows concerning this species: "Mr. A. Busck very kindly sent me a European specimen of this species for study and which corresponds in all particulars with the description given by European authors of this species. I have not seen any species from within our faunal limits that could be recognized as *cloacella* nor do I know of the existence of a well-authenticated specimen anywhere. I cannot help, therefore, but to consider the occurrence of *cloacella* in our fauna as very doubtful."

At Matawan, New Jersey. on February 25, an old specimen of *Polyporus sulphureus*[1] Bulliard ex Fries collected from a telegraph pole was partly broken and found to contain numerous, small lepidopterous larvae. The remainder of the fungus was kept in a warm room and during the last of March and first half of April, moths of this species[2] emerged. *Polyporus tsugae* Murrill ex Overholts, collected at New Brunswick, New Jersey, is also a host of this moth as specimens emerged from this fungus during the second week of April. The species, therefore, hibernates as a larva and pupates during the spring. Of course in the warm laboratory, the moths emerged sooner than they would have done in the field. The larvae feed in the context of the fungus and pupate in the tubes. So as to facilitate the emergence of the moths, the pupae issue partly from the lower surface of the fungus.

Polyporus tsugae occurs on or about stumps and trunks of hemlock and pine, while *Polyporus sulphureus* is found on the stumps and trunks of deciduous and coniferous trees. According to Von Schrenk and Spaulding (U. S. D. A. Bur.

[1] Identified by Mr. Erdman West.

[2] Identified by Mr. A. Busck through the courtesy of Dr. L. O. Howard.

Plant Indus. Bull. 149) *Polyporus sulphureus* occurs chiefly on oaks, chestnut, maples, black walnut, butternut, alder, locust, apple and pear and is widely distributed throughout the United States and Canada and in most of the forest regions of Europe where it is regarded as a destructive parasite both on deciduous trees and conifers.

Full Grown Larva. Length 6.2 mm.; width 1.4 mm. Subcylindrical; whitish except for head and mouth parts which are dark; sparsely hairy, hairs long, arising from somewhat tuberculate bases; entire body surface covered with a fine short pile; antenna cylindrical, two-jointed, terminated by one long and several short hairs; ocelli lateral, five in number, three in one group and two in the other; dorsal surface of second and third thoracic and first abdominal segments transversely wrinkled; legs whitish, terminated by strongly chitinized hooks; abdominal segments 4, 5, 6, 7 and 8 longer than other body segments.

Pupa. Length 5 mm., width 1.1 mm. Brownish, sparsely hairy; dorsal surface of abdominal segments 3, 4, 5 and 6 bearing two transverse rows of short stout spines placed close together; remaining three abdominal segments bear a single dorsal row of larger and fewer spines; abdominal dorsal spines point posteriorly; last abdominal segment bears a ventral pair of chitinous hooks curved anteriorly.

Adult. Tinea cloacella Haworth, *Lep.-Brit.*, 563, 1829; Dietz (loc. cit.) gives the following description by Meyrick: "Head whitish ochreous. Forewings ochreous brown, more or less mixed with whitish and strigulated with dark fuscous; a spot on base of costa, another beyond it, a thick oblique spot from costa reaching middle of disc, an elongate spot on fold before middle, and some small posterior costal and dorsal spots dark fuscous; a small round whitish posterior spot in disc. Hindwings fuscous. Exp. 10-17 mm."

Richness of Borneo in Coleoptera.

"The great majority of the Coleoptera taken at Mount Merinjak were again new to me, which goes to show how every hill and mountain in a great island like Borneo must be thoroughly explored before we have any idea of the tremendous wealth of species the island will produce. Wallace during his stay in Borneo spent nearly the whole of his time on the Sadong River in Simunjan, and collected nearly 2000 species of Coleoptera, of which nearly 300 were Longicorns. During my short stay [six months] I obtained examples of approximately 3189 species, of which 369 were Longicorns, about 90 of these probably nov. spp. We must remember that Wallace was collecting practically all orders, whereas I was specializing more or less." [A table of the number of species by families is given.]—G. E. Bryant in The Ent. Mo. Mag., London, April, 1919.

Life History and Habits of Silpha inaequalis Fab. (Coleoptera).

By Milton T. Goe, Portland, Oregon.

On July 16th while strolling in a secluded place, my object being to secure some live insects for life history observations, I discovered the carcass of a cat, under or near which were many kinds of beetles that gather around decaying animal matter. From among these I secured a few live specimens of *Silpha inaequalis* which I took home and placed in wide-mouthed tobacco jars containing a couple of inches of fresh moist soil, a few dry leaves beneath which they could hide, a shallow vessel of water, and a small piece of beef. The jars were then covered with a tin cover, the center of which had been cut away and a piece of cheese-cloth glued over the opening so as to admit plenty of air.

Two pairs were kept for study, but as one female laid but one batch of eggs and as both male and female soon died the data here given are from a single pair.

Freshly-killed flies were often thrown into the jar and were eaten by the beetles in preference to the stale meat. They sometimes dug themselves into the soil but remained on top most of the time, often hiding under the leaves, seldom under the stale meat. They were frequently found drinking. Close watch was kept for eggs, and on the twentieth day of July the first eggs were found and in the soil. As it is generally stated that these insects deposit their eggs in the carcass, I wish to emphasize the fact that these Silphas, without an exception, deposited their eggs in the soil. Only once did we observe this female in the act of laying, and then she placed the tip of her abdomen deep in the soil and when she had finished scratched the dirt back with her front tarsi to cover the eggs more securely.

The eggs are white, almost round, and about two millimeters in diameter. The egg-laying period covered thirty-six days and she averaged a little less than two eggs per day.

Following are the dates and the exact number of eggs laid each day:

July 20	6 eggs	August 1	2 eggs
July 21	3 eggs	August 3	1 egg
July 23	9 eggs	August 5	1 egg
July 24	3 eggs	August 15	4 eggs
July 26	6 eggs	August 18	6 eggs
July 28	5 eggs	August 20	7 eggs
July 30	5 eggs	August 23	2 eggs
		August 25	2 eggs

Total 62 eggs

On August 27th this female died. The six eggs laid July 20th were buried in some moist soil in a jar to hatch, and July 26th four coal-black larvae with yellowish red beads and black antennae made their appearance. These larvae were quick of motion; fed freely on the stale beef; rarely entered the soil, but usually could be found close together under the dry leaves.

Moulting occurred twice before they entered the soil to pupate; the first time July 30th, the second time August 3rd. When moulting the exuviae split at head and thorax and the insects crawl out, leaving the cast skins much resembling dead larvae.

During the afternoon of August 11th two of the larvae entered the soil to transform and the two remaining out were acting very strangely. They would dash frantically across the jar in which they were kept, suddenly stop and curl up on their sides, lie so a second, then roll over on their backs, then up and dash away again. These actions were repeated many times showing the unrest at the time this transformation was about to begin.

As an experiment, we dropped a few drops of water upon them, which seemed to have a soothing effect, as they lay quietly as if appreciating it. During the night, they, too, entered the soil. August 18th we uncovered them and they were unchanged in form but were pure white in color. Three of the four larvae developed, coming out of the soil as adults August 28th, 29th and 31st, respectively.

In this instance, the period of incubation was six days; the larval period sixteen days; the pupal period from seventeen to twenty days.

The young beetles ate very little at any time, and during the

winter months took no food at all. They spent most of their time in the soil, seldom being seen on top.

March 30th a piece of liver was placed in the jar and a few hours later one of the beetles was found clinging to it, this being the first evidence of their eating anything since November. During April these insects died, thus closing our investigations.

[Blatchley, in his Coleoptera of Indiana, p. 276, has figured the various stages of *Silpha inaequalis* after Riley.—Ed.]

On the Hymenopterous Parasites of Kermes (Homop., Coccidae).

By L. O. Howard, Washington, D. C.

In the very interesting article in *Entomological News* for April, 1919, on "Euclemensia bassettella (Clemens), the Kermes Parasite," by A. H. Hollinger and H. B. Parks, the authors have brought together much important material concerning this unusual parasitic Lepidopteron. In the course of this article, the writers state that they have never reared any Hymenoptera from *Kermes*, either in Missouri or Texas.

From the context, however, they apparently have not studied the subject for a very considerable length of time, and I feel reasonably sure that Hymenopterous parasites of *Kermes* will be found sooner or later in both Missouri and Texas, just as they have been found in so many other parts of the world. A good many years ago (in 1890) I found *Kermes* at Ithaca, New York, infested both by this Lepidopterous parasite and by a Hymenopterous parasite which I subsequently described as *Aphycus pulchellus* (afterwards placed by Timberlake in his genus *Aenasioidea*).

I have taken the trouble to go through the records and to examine the bred specimens in the notes and collections of the Bureau of Entomology and the National Museum, and submit the following list of Hymenopterous parasites of *Kermes*, both from these sources and from the literature. There can be no doubt that the hosts in the cases of the American rearings

were true *Kermes*, but following the first list is a list of records taken from the remarkable list of rearings by Giraud collected and annotated by Laboulbène and published in the *Annales de la Societé Entomologique de France* for 1877 (pages 397-436) in which the identification of the hosts as *Kermes* is open to doubt, judging from the food plants on which they occurred. No true *Kermes* are known except upon oak, and the food plants indicated in this French list belong to a variety of genera. It is altogether likely that Giraud called almost any naked Lecaniine *Kermes*. And these records are included here simply because they are already matters of record. It is evident that they should not be accepted except possibly in the cases where they are recorded as occurring on *Quercus*. Mr. Harold Morrison has prepared a note on these Giraud rearings which is appended to the list.

Aenasioidea kermicola Timb.

Kermes galliformis Riley. Murray, Utah, Sept. 16-21, 1914, P. H. Timberlake.

Kermes essigii King on *Quercus agrifolia*, Pasadena, California, Aug. 7, 1912, P. H. Timberlake. Timberlake, 1916, Proc. U. S. N. M., 50, p. 584.

Aenasioidea latiscapus (Gir.).

Kermes pubescens Bogue on oak. Urbana, Illinois, A. A. Girault. Girault, 1911, Can. Ent., 43, pp. 168-78.

Aenasioidea (Aphycus) pulchella (How.).

Kermes on *Quercus tinctoria*, Ithaca, New York, Jan. 25-30, 1890, L. O. Howard. Howard, 1898, Proc. U. S. N. M., 21, p. 242.

Aenasioidea tenuicornis Timb.

Kermes miyasakii Kuwana. Akabane, Japan, Aug., 1909, S. I. Kuwana. Timberlake, 1916, Proc. U. S. N. M., 50, p. 583.

Blastothrix longipennis How.

Kermes pubescens Bogue. Guelph, Canada, Alfred Eastham. Eastham, Rept. Ent. Soc. Ont., 1910, p. 75.

Chiloneurus lineascapus Gahan.

Kermes on oak, College Park, Maryland, May 7, 1898, A. B. Gahan. U. S. N. M. collection.

Kermes on lilac, College Park, Maryland, May 7, 1898, Franklin Sherman, Jr. Gahan, 1910, Can. Ent., 42, p. 207.

Chiloneurus dubius How.

Kermes sp. Malden, Massachusetts. Bureau Ent. Notes, No. 2404.

Chiloneurus cushmani Cwfd.

Kermes sp. Vienna, Virginia, May 24, 1911, R. A. Cushman. Crawford, 1911, Proc. Ent. Soc. Wash., 13, p. 126.

Comys sp.

Kermes galliformis. Los Angeles, California. U. S. N. M. Collection.

Comys, n. sp.

Kermes nigropunctatus. Whittier, California, E. W. Rust. Bureau Ent. Notes.

Comys sp. (probably *fusca*).

Kermes sp. on live oak. Houston, Texas, March 19, 1919, A. D. Hopkins. Bureau Ent. Notes.

Cristatithorax pulcher Gir.

Kermes pubescens Bogue on oak. Urbana, Illinois, A. A. Girault. Girault, 1911, Cant. Ent., 43, pp. 168-78.

Encyrtus sp. (*cyaneus* group).

Kermes on oak. Tallulah, Louisiana, May 21, 1907, A. H. Rosenfeld. U. S. N. M. Collection.

Microterys speciosissimus Gir.

Kermes pubescens Bogue on oak. Urbana, Illinois, A. A. Girault. Girault, 1911, Can. Ent., 43, pp. 168-78.

Microterys cincticornis Ashm.

Kermes pubescens Bogue on oak. Urbana, Illinois, A. A. Girault. Girault, 1911, Can. Ent., 43, pp. 168-78.

Kermes pubescens on oak. Lawrence, Massachusetts, Geo. B. King. Bureau Ent. Notes, No. 8143.

Coccophagus n. sp.

♀ ♂ *Kermes quercus* (*undulata*). Nogales, Arizona, May 3, 1897, A. Koebele. U. S. N. M. Collection.

Coccophagus scutatus How.

Kermes sp. on *Quercus agrifolia.* Los Angeles, California, A. Koebele and D. W. Coquillett. Howard, 1911, Jour. Econ. Ent., 4, p. 277; Mercet, 1912, Trab. Mus. Nat. Madrid, p. 244.

Kermes nigropunctatus. Southern California, Aug. 7, 1909, E. R. Sasscer. U. S. N. M. Collection.

Myiocnema comperei Ashm.

Kermes acaciae Mask. Sydney, New South Wales, Dec. 21, 1899, A. Koebele. U. S. N. M. Collection.

Prospaltella citrella How.

♀ ♂ *Kermes quercus* (*undulata*). Nogales, Arizona, May 3, 1897, A. Koebele. U. S. N. M. Collection.

Gyrolasia sp.

Kermes pubescens Bogue on oak. Urbana, Illinois, A. A. Girault. Girault, 1911, Can. Ent., 43, pp. 168-78.

Pachyneuron micans How. (?)
Kermes pubescens Bogue on oak. Urbana, Illinois, A. A. Girault. Girault, 1911, Can. Ent., 43, pp. 168-78.

Giraud's records of his French rearings (Ann. Soc. Ent. France, 1877).

Pachyneuron kermiphagus Giraud. *Kermes* on *Festuca, Carpinus* and *Crataegus.*
Eunotus obscurus Giraud. *Kermes* on *Carpinus, Crataegus* and *Ostrya.*
Encyrtus punctipes Dal. *Kermes* on *Crataegus, Carpinus, Aesculus, Alnus, Quercus* and *Ulmus.*
Encyrtus erichsoni Westw. *Kermes* on *Ostrya vulgaris, Acer eriocarpus* and *Festuca.*
Encyrtus apicalis Dalman. *Kermes* on *Acer eriocarpus, Ostrya vulgaris* and *Pinus picea.*
Coccophagus scutellaris Nees. *Kermes* on *Alnus* and *Festuca.*
Coccophagus circumscriptus Ratzbg. *Kermes* on *Pinus picea.*
Ericydnus paludatus Halid. *Kermes* on *Pinus picea.*
Cerapterocerus corniger Haliday. *Kermes* on *Quercus sessiliflora.*
Cerapterocerus mirabilis Westw. *Kermes* on *Festuca.*
Chiloneurus elegans Westw. *Kermes* on *Laurus cerasus.*
Chiloneurus ornatus Westw. *Kermes* on *Salix.*
Coccophagus pantherinus Giraud. *Kermes* on *Festuca.*
Comys obscurus Dalman. *Kermes* on *Salix.*
Encyrtus aralius Walker. *Kermes* on *Festuca.*
Encyrtus cyaneus Dal. *Kermes* on *Festuca.*
Encyrtus festucae Giraud. *Kermes* on *Festuca.*
Encyrtus pascuorum Foerster. *Kermes* on *Festuca.*
Encyrtus pratorum Giraud. *Kermes* on *Festuca.*
Eunotus cretaceus Walker. *Kermes* on *Festuca.*
Rhopus debilis Foerster. *Kermes* on *Triticum repens.*

Appended Note by HAROLD MORRISON.

None of the species of "Kermes" in the Giraud list appears to belong to that genus in its modern taxonomic sense. This opinion is based on the fact that with two exceptions, one of which appears to be accidental, only *Quercus* spp. are recorded as host plants of the species of this genus, and that there are in France certain common Lecaniine scales known to occur on the host plants given in this list. The probable identity of these different scale insects is given below:

Festuca spp. All records from this host plant are probably *Eriopeltis festucae* or *E. lichtensteinii*, the latter being probably a synonym of the first. This species is covered by a cottony sac in the last stages, just before oviposition, but appears to be naked in its early stages of growth.

Triticum repens. This record is probably for the preceding species.

Quercus sessiliflora. Regarding this "Kermes," Reh, Allg. Zeitschr. Ent., 8, 1903, p. 355, states: "der 'Kermes du Chene' der franzosischen Autoren ist *Lecanium pulchrum* King." This statement probably applies to this record from the list of Giraud and Laboulbène.

Laurus cerasus. A number of Lecaniine species have been reported from *Laurus.* The most common is *Coccus hesperidum*, but it is impossible to suggest any certain genus and species for this record.

Salix spp. This coccid is possibly *Lecanium capreae*, but might be one of several Lecaniine species.

Pinus picea. This reference is probably to *Physokermes piceae*, although it might refer to one of several species.

Alnus sp. Probably refers to *Lecanium coryli.*

Acer sp. Possibly *Lecanium corni*, but might be one of several species.

Ostrya vulgaris. Perhaps *Lecanium corni*, but might be one of several species.

Crataegus sp. Might be any one of several species of *Lecanium.*

Carpinus sp. Probably *Lecanium coryli*, but might be one of several species.

Aesculus sp. Probably *Lecanium coryli.*

Ulmus sp. Might be one of several species of *Lecanium* or even *Gossyparia spuria.*

Regarding the taxonomic position of the Genus *Kermes* Boit., this genus has at various times been included with the Lecaniine scale insects, and with the large group of the mealybugs, as recognized by Cockerell and by the Fernald Catalogue of Coccidae. Of recent years, however, there has been a growing tendency to consider this single genus as a separate group of the Coccidae having subfamily value as compared with the subfamilies at present recognized. The name *Hemicoccinae* is given to this group. What its ultimate position in the classification of the family will be it is impossible to state, but at present it seems a little more closely related to the Lecaniinae (or Coccinae) than to any other subfamily.

Notes on Cosmopterygidae, with Descriptions of new Genera and Species (Microlepidoptera).

By ANNETTE F. BRAUN, Cincinnati, Ohio.

Cosmopteryx opulenta n. sp.

Palpi white, outer and inner surfaces each marked with a black longitudinal line. Antennae grayish brown, becoming darker towards apex; with a conspicuous white line on anterior surface near base; last segment black, or sometimes merely black-tipped; next three preceding segments white; next three segments black, followed by a white, then a black, then a white segment. Head and thorax grayish brown, with three longitudinal white lines.

Fore wings brownish gray, or seal brown, with the basal half marked with five fine white longitudinal lines; one starting from base just within the costal edge diverges from the costa outwardly, extending about two-thirds through the basal brown area; a second extends along the extreme costa from the basal fourth almost or quite to the yellow fascia, becoming broader outwardly; a third along middle of wing from base to a little beyond the costo-basal streak; a fourth shorter streak below fold not attaining the base; a fifth white streak dorso-basal. Just beyond middle of wing, a yellow fascia. Four patches of metallic scales; the costal one of the inner pair limits the fascia inwardly, not touching the costa, and has a few black scales on its outer margin; dorsal patch placed farther back and with black scales on its inner margin; the yellow fascia extends between them and borders the inner side of the dorsal patch, sometimes almost to dorsal margin. Posterior pair of metallic patches almost opposite, attaining the margins, and limiting the yellow fascia outwardly, except in the middle of the wing where the fascia extends between and a little beyond them. Costal cilia immediately following the second costal metallic patch white; occasionally the yellow of the fascia is almost confluent with this white patch. Remainder of apical portion of wing and cilia of the basal brown ground color, except for a long white line extending from just beyond the yellow fascia to the tips of the apical cilia. Hind wings and cilia concolorous with fore wings. Legs gray streaked and banded with white.

Expanse: 9.5-10.5 mm.

Locality: Rivera, Los Angeles County, California.

Type and paratypes in writer's collection.

Nine specimens bred from irregular mines on *Ambrosia psylostachya*. The mines extend principally along the midrib, with irregular projections branching out on either side. The larva spins a cocoon on the densely pubescent under side of the leaf, constructed of silk, and the whitish pubescence of the leaf. Mines collected in October; imagoes in April of the following year.

This species is apparently intermediate between *C. delicatella* Wlsm. and *C. quadrilineella* Cham.; the additional white streak along the second fourth of costa distinguishes it from both.

Cosmopteryx clemensella Stainton.

The larvae of this species mine the overwintering leaves of *Carex laxiflora* var. *latifolia*, making long semitransparent irregular galleries, often deserting one mine to form a new one. The larvae feed during the fall and early winter, when the weather is sufficiently mild, and become full fed in the spring. They pupate in a wrinkle in the leaf, and the moths appear in May and June. There is apparently but one generation a year.

PERIPLOCA new genus.

Labial palpi long, recurved, laterally flattened, terminal joint shorter than second, acute. Head short, vertex broad. Antennae 2-3, basal segment flattened, somewhat enlarged, projecting posteriorly. Fore wings ovate-lanceolate, acuminate; 1b furcate, 2 from near end of cell, indistinct, 3 from angle, 4 obsolete toward origin, especially in female, 5 and 6 out of 7, 8 out of 7 before 5, 9 approximate to their stalk, 10 arising opposite 2 in female, much nearer base in male, in which it is nearly parallel to 11, which in both sexes arises before middle of cell, transverse vein indistinct between 4 and 7. Hind wings linear-lanceolate, 1-4, cilia 5, costal shoulder pronounced; 2, 3, 4, equidistant and parallel, 4 and 5 connate or nearly so, approximate to 7, 6 out of 7 near apex; transverse vein indistinct but perceptible. Posterior tibiae with bristly scales above and long hairs above towards apex.

Genotype: *Periploca purpuriella* n. sp.

Periploca purpuriella n. sp.

Palpi bluish black, face bronzy. Head, antennae, thorax and base of fore wing bluish black, gradually shading outwardly to reddish bronze. According to the light the wing may appear almost entirely deep blue, or entirely reddish bronze except at extreme base. Hind wings shining, becoming bronzy towards apex. Legs deep bluish black. Expanse: 8 mm.

Locality: Fredalba, San Bernardino Mts., California, August 19 to September 1 (G. R. Pilate).

Type and paratypes in writer's collection.

Described from about 45 specimens.

AMAUROGRAMMA new genus.

Head rather elongate, front prominent. Antennae 2-3, biserrate in outer half, basal segment rather long, slightly enlarged distally. Labial palpi long recurved, somewhat thick-

ened with scales, third segment a little over one-half the second, acute. Posterior tibiae rough-haired above and on outer half beneath.

Fore wings with tufts of raised scales; very narrow, apex long pointed; 1b furcate, lower side of furcation obsolete, 2 absent, 3 and 4 long stalked from angle of cell, 5 indistinct except near margin, 7 and 8 out of 6, 11 from middle of cell. Hind wings 1-3, linear beyond costal shoulder, with apex produced; cilia 6; most of veins obsolete, lower margin of cell distinct, 2 and 3 given off close to margin, 4 and 5 absent, 6 and 7 long stalked.

Genotype: *Amaurogramma extensa* n. sp.

A development of *Chrysopeleia*, from which it differs by the more elongate and slender palpi, the difference being due to the greater length of the second segment, and the narrower elongate wings, with stalking of 4 and 5 in the fore wing; the extreme narrowing of the hind wings is accompanied by the obsolescence of most of the veins. *Chrysopeleia quadricristatella* Chambers apparently belongs here, but is distinct from the species described below.

Amaurogramma extensa n. sp.

Head, thorax and fore wings clothed with whitish-tipped gray scales, producing a uniformly irrorated aspect. Four patches of blackish raised scales on the fore wing, each margined inwardly with dull whitish; the first below the fold at one-fourth, the second on the disk in the middle of the wing, the third a little beyond it on the dorsum, the fourth at end of cell; a fifth raised patch beyond is distinct in the male. Minute tufts along the termen. Hind wings and cilia gray. Legs gray, with tips of segments whitish; hind tibiae with an oblique white bar across the middle of the outer side. Abdomen gray, upper side of first four or five segments yellowish. Expanse: 7.5-9 mm.

Type (male), Loma Linda, California, July 22; paratype (female), Loma Linda, California, June 3 (G. R. Pilate), in writer's collection.

Ithome unimaculella Chambers.

Ithome unimaculella Chambers, Can. Ent. vii, 94, 1875; xi, 9, 1879.

The statement by Chambers that *Ithome* cannot be separated generically from *Perimede* is apparently the basis for the accepted view that *I. unimaculella* is a synonym of *P. erranscella* Cham. While the two insects are superficially much alike, they can be easily separated structurally and by markings. The characters of *Ithome* Cham. are as follows:

Palpi long recurved, slender, smooth, third segment a little exceeding the second, acute; antennae as in *Perimede*, basal segment somewhat elongate, slightly clavate, stalk serrate near apex. Fore wings without scale tufts; 1b furcate, 2 from very near angle of cell (opposite origin of 10), 3 from angle, 4 remote at origin, but curving immediately downward toward 3, 7 and 8 stalked, 6 out of 7 near apex, 11 from middle of cell. Hind wings 1-2, linear lanceolate, 2, 3, 4 parallel, equidistant, 5 approximate to or connate with 4, 6 and 7 long stalked, cell open between 5 and 7. Hind tibiae rough haired above.

Apart from the stalking of 6 with 7 in the fore wing, and the stalking of 6 and 7 of hind wing, the position of vein 2 of fore wing is the chief difference between this genus and *Perimede*, where this vein arises but slightly beyond 11. The hind wings are much narrower, with more deeply excised costa and pronounced costal shoulder. To Chambers' genus *Eriphia* it has no resemblance.

In addition to these structural differences, *Ithome unimaculella* differs from *Perimede erransella* by its smaller size (7.5-9 mm.), the series of distinct white spots on the under surface of the third palpal segment (varying in number from four to seven, including the white extreme apex as a spot), the absence of markings except the costal spot before the cilia, a very minute plical spot, and the immaculate under surface of the wings. As both species easily become worn on the upper side, and a slight abrasion produces a sordid whitish spot, the palpal markings and the immaculate under surface of the wings are the most reliable characters.

Perimede falcata n. sp.

Head and thorax shining whitish gray, densely dusted with fuscous; palpi shining grayish brown with the upper sides whitish, lower surfaces faintly hoary. Antennae dark grayish fuscous.

Fore wings shining grayish white almost overlaid with purplish fuscous dusting. Three spots of raised black scales margined with white inwardly, the first in the fold sometimes elongate, the second in the middle, the third at the end of the cell; a whitish costal spot at the beginning of the cilia and an opposite dorsal one. A black spot in apex, margined inwardly with white scales; a series of minute raised black specks along the termen, usually with whitish scales bordering them inwardly. Cilia along costa to a point opposite apex dark fuscous, beneath apex for about half the termen white, rest of cilia dark fuscous, the line separating the white from the fuscous terminal cilia curving obliquely across the cilia. Under surface of

wings with apex black and series of black spots repeated. Hind wings dusted grayish fuscous; extreme apex on both surfaces black; the under surface mottled with white. Abdomen fuscous, paler beneath, with four black spots on each side of under surface. Legs fuscous, apices of joints white. Expanse: 11.5-14 mm.

Localities: Cincinnati, Ohio; Pittsburgh, Pennsylvania (Engel).

Type (♂), Cincinnati, Ohio, July 28; paratype (♀), Cincinnati, Ohio, July 5; four paratypes, Pittsburgh, Pennsylvania, June 12-30, all in writer's collection.

The conspicuous white patch in the terminal cilia distinguishes this species from *P. erransella* Cham. and from *P. particornella* Busck; from the latter the unicolorous antennae also separate it. It is a much broader winged species than *P. erransella;* with this exception its structural characters differ in no respect from the type of the genus.

Psacaphora metallifera Wlsm.

A number of moths bred from larvae mining leaves of *Cuphea petiolata* answer the description of *Elachista* (?) *metallifera* Wlsm. described from a single specimen in which the type of marking is evidently that of *Psacaphora*. The antennal markings are by no means constant; sometimes the last four or five segments are entirely silvery white; sometimes there is a series of four or five whitish or grayish spots separated by dark spots; and sometimes the entire antennal stalk is dark brown. The blue and purple iridescent dorsal spot is in all, except one specimen, extended along the termen to the apex; in other respects the specimens agree minutely with the description. It is remarkable for its minute size; expanse varying from 4.7 mm. to 6.5 mm.; that of the type was given as 5 mm.

The larva makes several mines; the earliest extremely short and narrow and difficult to discern; later it makes long contorted serpentine mines or blotches, eating out the whole of the smaller leaves near the top of the plant. The larva often crawls for a couple of inches with the greatest ease amongst the extremely viscid hairs of the plant, in which ants and small flies are often caught and held fast. The general color of the larva is bright red, due to the obscuring of the yellowish ground color by the confluence of the bright red markings on either side of the mid-dorsal line. Cocoon spindle-shaped, of dense straw-colored silk.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., NOVEMBER, 1919.

The Use of the Term Larva.

We have recently reread Professor Comstock's article in the *Annals of the Entomological Society of America* for June, 1918, entitled "Nymphs, Naiads and Larvae." It will be recalled that in it he proposes to limit the term *nymph* to the early stages of insects which have a gradual metamorphosis, as the Orthoptera and Hemiptera, and that *naiad* be used for used for the immature stages of Plecoptera, Odonata and Ephemerida ("incomplete metamorphosis"), while *larva* is to be restricted to the young of insects with complete metamorphosis, Diptera, Lepidoptera et al., as some have already done.

To us, however, this very narrow use of *larva* appears decidedly objectionable, since the word has come to possess a much wider significance, having been very generally employed, in various languages, to denote the active, postembryonic stage of many phyla which presents a more or less distinctly different aspect from the adult. Thus, Professor Edmond Perrier, even after writing:

> The words *larva* and *metamorphosis*, borrowed from the vocabulary of the entomologists, have indeed in Entomology a precise signification from which one turns aside absolutely when one applies them to the development of the Echinoderms, or to that of the Crustacea, or of the great majority of worms. Metamorphosis is a more or less rapid change, either in the internal organs or in the external forms, of an organism already in possession of all the morphological units of which its body is to be formed,

goes on to add:

> Before the transformation, the animal is in the state of a *larva*, after it in the *perfect state*. Such transformations can be observed in numerous groups of the animal kingdom outside of the class of Insects. One can consider as a metamorphosis the transformation of *Ephyra* into a Discomedusa; that of the vermiform larva of *Comatula* into the cystidean larva; that of the females of parasitic Copepods into Lernaeans; that of cypris-larvae of Cirripedes into *Anatifera*, *Balanus* or *Sacculina;* that of symmetrical into asymmetrical *Pagurus;* that of larvae of Bryozoa into protomerids; that of three-segmented

larvae of Brachiopods into adult Brachiopods; that of the tadpoles of Ascidians into Ascidians, of Ammocetes into Lampreys, of Leptocephalus into Conger eels, of symmetrical into asymmetrical *Pleuronectes*, of the tadpoles of Batrachians into salamanders, frogs and toads. [Translated from his *Traité de Zoologie*, pp. 194-5.]

This general use of *larva* for all groups of animals in which a similar stage obtains is decidedly convenient, some such term being a necessity. We notice that the latest text-book of Entomology, Prof. Lochhead's *Class Book of Economic Entomology*, uses *larva* in this wide sense. The subject is one which might well be discussed by the Entomological Society of America at its next meeting.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are all grouped at the end of each Order of which they treat.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A. London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

4—Canadian Entomologist, London, Canada. **5**—Psyche, Cambridge, Mass. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **11**—Annals and Magazine of Natural History, London. **12**—Journal of Economic Entomology, Concord, N. H. **13**—Journal of Entomology and Zoology, Claremont, Cal. **17**—Lepidoptera, Boston, Mass. **19**—Bulletin of the Brooklyn Entomological Society. **20**—Bulletin de la Societe Entomologique de France, Paris. **30**—Tijdschrift voor Entomologie, The Hague, Holland. **32**—Insecta. Revue Illustree d'Entomologie, Rennes. **33**—Annales de la Societe Entomologique de Belgique, Brussels. **37**—Proceedings of the Hawaiian Entomological Society. **39**—The Florida Buggist, Gainesville. **40**—Genera Insectorum, Diriges par P. Wytsman. **50**—Proceedings of the United States National Museum, Washington. **52**—Zoologischer Anzeiger, Leipsic. **61**—Proceedings of the California Academy of Sciences, San Francisco. **62**—Bulletin of the American Museum of

Natural History, New York. **69**—Comptes Rendus, des Seances de l'Academie des Sciences, Paris. **73**—Proceedings of the Linnean Society of New South Wales, Sydney. **79**—Bulletin of the Museum of Comparative Zoology at Harvard College, Cambridge, Mass. **90**—The American Naturalist, Lancaster, Pa.

GENERAL. Berger, E. W.—Entomology as a pure science. **39,** ii, 81-5. **Blackmore, E. H.**—Rare and uncommon insects taken in British Columbia during 1918 (Rept. Prov. Mus. Nat. Hist., Br. Columbia, 1918, T. 7-13). **Bordage, E.**—Sur quelques particularites de l'histolyse observees pendant la metamorphose des insectes metaboles. **20,** 1919, 258-9. **Escherich, K.**—Zeitschrift fur angewandte entomologie IV, Heft 2. **Godman, F. DuC.**—Memorial to the late Frederick DuCane Godman. **8,** 1919, 206-7. **Ireland, W. H.**—On the migration of insects. **17,** iii, 57-8. **Klapalek, F.**—[Notice of death.] **52,** I, 208. **Lizer, C.**—Primer ensayo bibliografico de entomologia Argentina. (Primera Reun. Nac. Soc. Argent. Cien. Nat., Tucuman, 1916, 351-380.) **McDunnough, J. H.**—Directions for collecting and preserving insects. (Canada Dept. of Agric., Ent. Branch, Circ. 12). **Stoner, D.**—Collecting terrestrial arthropods in Barbados and Antigua. **4,** 1919, 173-8 (cont.).

GENETICS, ETC. Zeleny, C.—Change in the bar gene of Drosophila involving further decrease in facet number and increase in dominance (Jour. Gen. Physiology, ii, 69-71).

ARACHNIDA AND MYRIAPODA. Emerton, Banks & Chamberlin—Spiders, Mites and Myriapods (Rept., Canadian Arct. Exp., 1913-18, iii, H.).

NEUROPTERA. Folsom, J. W.—Collembola from the Crocker Land Expedition. **62,** xli, 271-303. **Longinos Navas, R. P.**—Algunos insectos N. de la Republica Argentina (Revista, R. Acad. Cien Exact. Fisic. Natur., Madrid, xvii, 287-305.) **Navas, R. P. L.**—Algunos insectos de la Republica Argentina (Revista R. Acad. Cien. Exact. Fisc. Nat., Madrid, xvi, 491-504).

Baker, Ferris & Nuttall—Mallophaga and Anoplura (Rept., Canadian Arctic Exp., 1913-18, iii, D.). **Banks, N.**—Neuropteroid insects (Rept., Canadian Arctic Exp., 1913-18, iii, B.). **Folsom, J. W.**—Collembola (Rept. Canadian Arct. Exp., iii, A.). **Treherne, R. C.**—Notes on Thysanoptera from British Columbia. **4,** 1919, 181-90. **Watson, J. R.**—New Thysanoptera from Florida. **39,** ii, 97-102, 116-19; iii, 2-7.

ORTHOPTERA. Pantel & de Sinety—Sur le nombre des stades postembryonnaires chez les Phasmides, leur fusion et leur dedoublement. **30,** lxii, 1-29.

HEMIPTERA. Baker, A. C.—On the use of the names Lachnus and Lachniella. **4,** 1919, 211-12. **Britton, W. E.**—Swarms of aphids. **12,** xii, 351. **Ferris, G. F.**—Observations on some mealybugs (Coccidae). Lack-producing insects of the U. S. **12,** xii, 292-99; 330-3. **Leonard, M. D.**—The immature stages of Strongylocoris stygica (Miridae). **4,** 1919, 178-80. **Lizer, C.**—Una nueva subespecie de "Ceroplastes" de la Republica Argentina (Coccidae). Sobre una nueva hemipterocecidia Argentina. (Primera Reun. Nac. Soc. Argentina Cien. Nat., Tucuman, 1916, Sec. Zool., 381-88.) **Merrill, G. B.**—Host list of the fluted, or cottony cushion scale. (Quart. Bul. Sta. Plant Bd. of Florida, iii, 125-33.) **Moreira, C.**—Les pucerons et leur oeuf d'hiver (Aphididae). **20,** 1919, 236-8. **Parshley, H. M.**—Note on the sexes of the Tingid, Melanorhopala clavata. A morphological note on the Tingoidea. **19,** xiv, 102-3; 109-10. **Riley, C. F. C.**—Some habitat responses of the large water-strider, Gerris remigis. **90,** liii, 394-414 (cont.). **Severin, H. H. P.**—Notes on the behavior of Eutettix tenella. **12,** xii, 303-8.

Drake, C. J.—A n. sp. of Velia from Florida. **39.** iii, 1-2. **Gibson, E. H.**—A review of the leafhoppers of the genus Gyphona north of Mexico. **50,** lvi, 87-100. **McAtee, W. L.**—Key to the Nearctic sps. of Piesmidae. **19,** xiv, 80-93. **Van Duzee, E. P.**—Hemiptera (Rept., Canadian Arctic Exp., 1913-18, iii, F.).

LEPIDOPTERA. Braun, A. F.—The synonymy of Helice and Theisoa (Micro-L.). **4,** 1919, 201-3. **Chapais, J. C.**—La lycie vulgaire (Nat. Canadien, xlvi, 25-7). **Hall, A.**—Descriptions of 12 new Nymphaline butterflies. **9,** 1919, 195-200. **Kaye, W. J.**—New sps. and gen. of Nymphalidae Syntomidae, and Sphingidae in the Joicey Collection. **11,** iv, 84-94. **Lewis, G.**—On the taxonomy of the Histeridae. **8,** 1919, 173-4. **Reiff, W.**—Notes on plate No. 3 (Heliconius, Papilio, Catocala). **17,** iii, 60-2. **Riley, N. D.**—Some new Rhopalocera from Brazil. **9,** 1919, 181-6 (cont.). **Rummel, C.**—Catocala tristis and gracilis on high-bush blueberry. **19,** xiv, 103. **Tillyard, R. J.**—On the morphology and systematic position of the family Micropterygidae. **73,** xliv, 95-136.

DIPTERA. Herms, W. B.—Occurrence of malaria and anopheline mosquitoes in northern California (U. S. Pub. Health Service, Reprint No. 541). **Johnson, C. W.**—Revised list of D. of Jamaica. **62,** xli, 421-49. **Kieffer, J. J.**—Observations sur les Chironomides decrits par J. R. Malloch. **20,** 1919, 191-4. **Malloch, J. R.**—The limits of the dipterous group Calyptrata. **19,** xiv, 111-12. **Roubaud, E.**—Antagonisme du betail et de l'homme dans la nutrition sanguine de l'Anopheles maculipennis. **69,** clxix, 483-6.

Alexander, C. P.—New Nearctic crane-flies, VIII. **4,** 1919, 191-9. New Nearctic sps. of the genus Erioptera (Tipulidae). **19,** xiv, 104-8. **Alexander, Dyar & Malloch**—Diptera (Rept., Canadian Arctic Exp., 1913-18, iii, C.). **Cole & Lovett**—New Oregon D. **61,** ix, 221-55. **Van Duzee, M. C.**—Key to the North American sps. of Medeterus, with descriptions of n. sps. **61,** ix, 257-70.

COLEOPTERA. Bickhardt, H.—Histeridae. **40,** 166a-b. **Blackman, M. W.**—Two bark-beetles attacking the trunks of white pine trees. **5,** xxvi, 85-96. **Burke, H. E.**—Biological notes on.... Chrysobothris femorata, and.....C. mali. **12,** xii, 326-30. **Champion, G. C.**—Another note on the habits of Melanophila acuminata. **8,** 1919, 177-8. **Crampton, G. C.**—Notes on the ancestry of the C. **13,** xi, 49-54. **Fenyes, A.**—Staphylinidae, subfam. Aleocharinae. **40,** 173a. **Grouvelle, A.**—Memoires entomologiques. Etudes sur les Coleopteres. Fasc. 1-2. (Soc. Ent. France). **Lameere, A.**—Cerambycidae, subfam. Prioninae. **40,** 172. **Matheson, R.**—Notes on Pelenomis sulcicollis (Curculionidae). **4,** 1919, 199-201. **de Peyerimhoff, P.**—Un nouveau type d'insectes Strepsipteres. **20,** 1919, 162-73. **Pic, M.**—Notes sur le genre Astylus, et description de deux esp. nov. (Melyridae). **20,** 1919, 188-90. **Weiss, H. B.**—Notes on Sulcacis lengi and Orchesia castanea, breeding in fungi. **4,** 1919, 203-4.

Blatchley, W. S.—Insects of Florida. Supplementary notes on the water beetles. **62,** xli, 305-22. **Fall, H. C.**—New C., VIII. **4,** 1919, 212-16.

HYMENOPTERA. Bordas, L.—Considerations generales sur les glandes venimeuses des H. terebrants. **32,** 1919, 94-6. **Brues, C. T.**—A n. sp. of the genus Scleroderma from the Galapagos Islands. **61,** ii, 309-10. **Desey, A.**—Instinct et intelligence experiences sur l'ammophile. **33,** lix, 86-95. **Wheeler, W. M.**—Ants of the Galapagos Islands. Ants of Cocos Island. **61,** ii, 259-308.

Banks, N.—The Psammocharidae of western N. A. **79,** lxiii, 229-48. **Bridwell, J. C.**—Miscellaneous notes on H., with descriptions of n. gen. & sps. [mostly Hawaiian]. **37,** iv, 109-165. **Cushman, R. A.**—Notes on certain genera of ichneumon flies, with descriptions of a new gen. and 4 n. sps. **50,** lvi, 373-82. **Phillips & Emery**—A revision of the chalcid flies of the genus Harmolita of America north of Mexico. **50,** lv, 433-71. **Stevens, O. A.**—Pangurgine bees of North Dakota and a new Epeolus. **4,** 1919, 205-10. **Timberlake, P. H.**—Revision of the parasitic chalcidoid flies of the genera Homalotylus, and Isodromus, with descriptions. **50,** lvi, 133-94. **Wheeler, W. M.**—A new paper-making Cremastogaster from the southeastern U. S. Ants of Tobago Island. **5,** xxvi, 107-12; 113.

AN INVESTIGATION OF THE LOUSE PROBLEM. By WILLIAM MOORE, Associate Professor of Entomology in the University of Minnesota, and ARTHUR DOUGLASS HIRSCHFELDER, Professor of Pharmacology in the same. Research Publications, Univ. Minn., viii, No. 4, July, 1919. 86 pp., 2 figs., 16 tables.—A paper growing out of the recent war. Although four-fifths of its pages are devoted to measures for checking or destroying the clothes or body louse (*Pediculus corporis*), a number of biological observations, some confirmatory, others contradictory, of the results of previous investigators occupy the early parts. The authors' experiments were conducted on lice raised in an incubator at 28-32 deg. C. and a relative humidity of 70-80 per cent., with two feedings on human volunteers per day. In dealing with the pathological conditions produced by lice "which had never bitten diseased individuals," the possibility that the insects were hereditarily infected is not considered. The effects of ordinary laundry practice as destructive of lice and nits were investigated and some suggestions for certainty of death are offered. The most valuable part of the paper deals with the action of pediculicides, especially those suitable for impregnation of underwear, and is pervaded throughout with the endeavor to determine the principles governing the toxicity of various substances, in line with Prof. Moore's researches published in the *Journal of Agricultural Research* for 1917 and 1918, instead of experimenting with all sorts of materials by a hit-or-miss empirical method.—P. P. C. (*Advt.*)

SEVENTEENTH REPORT OF THE STATE ENTOMOLOGIST OF MINNESOTA. By A. G. RUGGLES. St. Paul, Minn., Dec. 1, 1918. Rec'd. May 5, 1919. —In addition to a general report on insect conditions in 1918, and articles of economic interest on an oak twig girdler, *Agrilus arcuatus* Say and var. *torquatus* Lec., "the worst pest of black oaks discovered in recent years," the relative values of different arsenic salts for potato spraying, the carpenter ant as a destroyer of sound wood (of the white cedar), the occurrence of *Drosophila* in bottled milk, methods of combating the confused flour beetle and the clover seed chalcid, by Messrs. Ruggles, Graham, Riley, Chapman and Williamson, this volume contains three longer papers of taxonomic and geographical importance: a synopsis of the tribes and higher groups of the Aphididae by O. W. Oestlund, and preliminary reports on the Trombidiidae, and on the Hymenoptera, of Minnesota, by C. W. Howard and F. L. Washburn respectively. Mr. Howard has not identified the chigger, which not only attacks man but also birds, as the prairie chicken, quail and pheasants, in Minnesota, farther than that according to Oudemans it should be the larva of a *Microtrombidium*. Prof. Washburn gives professedly incomplete lists of the Hymenoptera actually identified from the State, accompanied by three four-color plates and excellent half-tone text figures.—P. P. C. (*Advt.*)

EXCHANGES.

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Pentatomidae.—Would like to purchase North American material in this family of Hemiptera. G. Chagnon, P. O. Box 521, Montreal, Canada.

Wanted—Specimens of fleshy and woody fungi from which beetles have been collected, together with names of host trees, names of beetles, localities and dates. All specimens will be gratefully acknowledged and identified, and the information properly accredited. Harry B. Weiss, State Department of Agriculture, Trenton, N. J.

Wanted—Tipulidae from all parts of North America. Material from the far North especially desired. Will buy or exchange. Dr. W. G. Dietz, 21 North Vine Street, Hazleton, Pa.

Aradus.—I am engaged on a review of the North American species of this Hemipterous genus and shall be glad to examine specimens from any part of the continent. Determinations in return for specimens needed in my work.—H. M. PARSHLEY, Smith College, Northampton, Mass.

For Exchange—Live pupae of *E. tityrus* and *H. tenuis*. What have you to offer? Joseph Syrovy, Jr., 4119 W. 21st Place, Chicago, Illinois.

Coleoptera. Cotypes of *Chrysobothris falli* VanDyke for exchange for rare Buprestidae, domestic or foreign. Also other species for exchange. Richard T. Garnett, 3600 Broadway, Oakland, California.

Noctuidae.—Will purchase, or exchange Lepidoptera from western states for the rarer noctuid moths of N. Am. Desire Hampson's work on this family, also other literature. Chas. A. Hill, Hamilton Apts., No. 310, Omaha, Nebraska.

Wanted for Cash—Central and South American (especially Brazilian) Rhopalocera in papers. Good condition. Dr. G. Granville Buckley, Rye Croft South, Manchester Road, Bury, Lancashire, England.

Complete Collection of Syrphid flies from this locality, all mounted with full data and correctly named, for exchange or sale. Desire Buprestidae and Cerambycidae, preferably from West. Alan S. Nicolay, 416a Grand Avenue, Brooklyn, New York.

Wanted—Perfect sp. of Cat. marmorata, walshii, arizonae, babayaga, desdemona, herodias, consors, somnus, agrippina, sappho, phrynia. I offer A-1 flebilis, lacrymosa, evelina, paulina, obscura, angusi lucetta, retecta, luctuosa, vidua, residua, epione, unijuga, partia, pura, purissima, aholibah, coloradensis, aspasia, faustina, luciana, zoe, innubens, hinda, scintillans, nubilis. Will give also exotics in exch.—Vl. G. Sasko, 2346 Walton St., Chicago, Ill.

For Exchange—Living pupae of Sphingidae, also bred specimens mounted; bred Catocalas; other material on pins and in paper. Wanted, N. A. and exotic Lepidoptera, N. A. Catocalas preferred. —Herman J. Erb, 925 Hatch Ave., Woodhaven, Long Island, N. Y.

Wanted—Therevidae from all parts of North America. Monographing family. Will exchange Diptera or other orders.—R. W. Doane, Department of Entomology, Stanford University, Cal.

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2124.—**Felt** (E. P.).—Five gall-making midges (Cecidomyidae). (Ent. News, **30**, 219-223, 1919)..... .10

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790.—**Hutson** (J. C.).—The North American species of the genus Sceliphron. (Tr. **45**, 203-227, 2 pls., 1919).... .45

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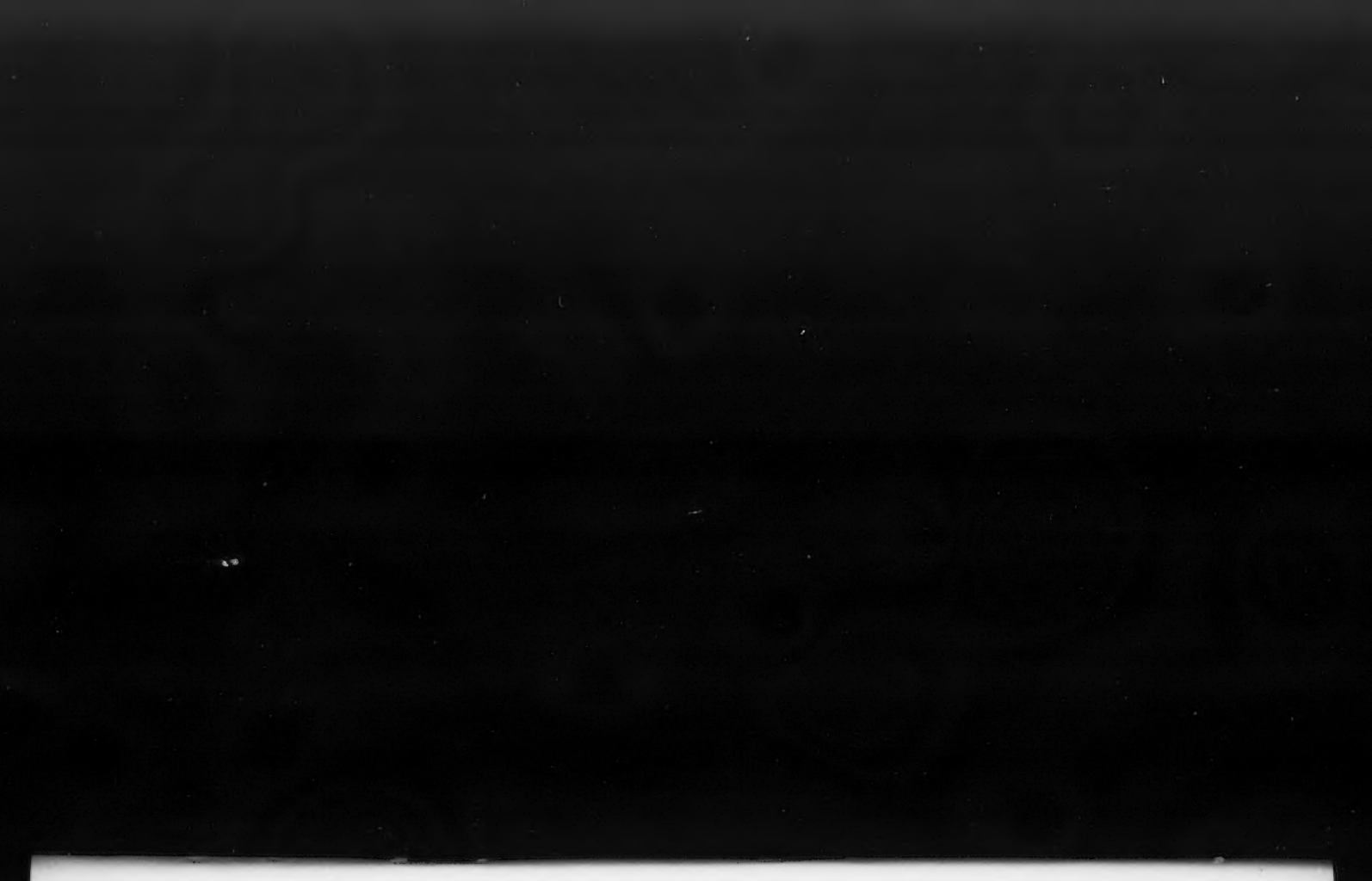
792.—**Hebard** (M.).—New genera and species of Melanopli found within the U. S., Part II (Acrididae). (Tr. **45**, 257-298, 3 pls., 1919) ..... .75

793.—**Hebard** (M.).—A new genus and species of roach from the U. S., and tropical N. America (Blattidae). (Tr. **45**, 299-302, ill., 1919) ..... .10

794.—**Hebard** (M.).—A new Central American genus and species of the group Blattellites (Blattidae). (Tr. **45**, 303-306, ill., 1919) ..... .10



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